Abstract: P3551

Right ventricular dysfunction in heart failure patients with reduced ejection fraction with and without chronic respiratory diseases: A treacherous combination for the ominous outcome?

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Background

Right ventricular (RV) dysfunction is common in heart failure patients. In the present study, we determined the impact of echocardiography defined RV dysfunction on outcomes in heart failure patients with reduced ejection fraction (<40%, HFrEF) with and without chronic respiratory diseases (CRDs: asthma, chronic obstructive pulmonary disease, occupational lung diseases, sleep apnea syndrome).

Methods

A total of 1264 HFrEF patients (Mean age: 68±13 years; male: 76.3%) referred to our department between 2009 and 2017 were included. Baseline demographic and clinical data were obtained by reviewing the medical records. All patients subsequently completed a median clinical follow-up of 26 (12-40) months by medical record review or telephone interview. The primary endpoint was all-cause mortality or heart transplantation (HTx). Right heart morphology and function were assessed by multiple echocardiographic parameters, including right atrial area (RAA), RV mid diameter (RVD), tricuspid annular plane systolic excursion (TAPSE) and systolic pulmonary artery pressure (sPAP).

Results

The proportion of NYHA functional class III-IV was 42.2%. Mean LVEF was 29.4±7.0%. CRDs was identified in 276 (21.8%) patients, 399 (30.5%, without CRDs n=290, with CRDs n=109) patients died (n=386) or underwent HTx (n=13). All-cause mortality/HTx was significantly higher in HFrEF patients with CRDs than without CRDs (39.5% vs. 29.4%, P=0.001).

Cox regression analysis showed that age, BMI, and other cardiac risk factors and comorbidities including diabetes, atrial fibrillation, coronary artery disease, kidney dysfunction, and anemia were associated with all-cause mortality/HTx (all P<0.05) besides CRDs. Multivariable Cox regression models showed that sPAP (HR 1.016, P<0.001), TAPSE (HR 0.964, P=0.003), RAA (HR 1.030, P<0.001), and RVD (HR 1.029, P<0.001) were independent determinants of all-cause mortality/HTx in HFrEF patients without CRDs, but not in HFrEF patients with CRDs after adjusted for above mentioned confounders.

With the cut-off values (sPAP>40mmHg, TAPSE<12mm, RAA>25cm², and RVD>36mm) derived from the 3rd quartiles, patients without CRDs were further grouped as normal RV function (all 4 parameters normal, n=427); mild to moderate RV dysfunction (1 or 2 parameters abnormal, n=467) and severe RV dysfunction (≥3 parameters abnormal, n=94). Risk of all-cause mortality/HTx was significantly higher in HFrEF patients with severe (51.1%) and mild to moderate RV dysfunction (34.7%) as compared to patients with normal RV function (18.7%, severe vs. normal: HR 1.616 , 95% CI 1.232-2.119, P=0.001; mild to moderate vs. normal HR: 2.657, 95% CI 1.845-3.824, P<0.001).
Conclusions

RV dysfunction is significantly associated with increased all-cause mortality in HFrEF patients without CRDs. Increased sPAP, RAA, RVD and decreased TAPSE are independent determinants of worse outcomes in HFrEF patients without CRDs, but not in HFrEF patients with CRDs.